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EMPLOYMENT LAWS IN DEVELOPING COUNTRIES

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ABSTRACT

Employment Laws in Developing Countries*

We survey the research on the effect of employment laws in developing countries, using papers published since 2004. The survey is further supported by cross-country correlation analyses. Both exercises show that developing countries with rigid employment laws tend to have larger informal sectors and higher unemployment, especially among young workers. A number of countries, especially in Eastern Europe and West Africa, have recently undergone significant reforms to make employment laws more flexible. Conversely, several countries in Latin America have made employment laws more rigid. These reforms are larger in magnitude than any reforms in developed countries and their study can produce new insights on the benefits of labor regulation.

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Introduction
2004 was a significant year in the analysis of labor regulation in developing countries. Three studies - Besley and Burgess (2004) on India, Heckman and Pagés (2004) on Latin America, and Botero et al (2004) on 85 countries around the world – brought this topic to the fold of development research by providing new evidence on the effects of rigid employment laws.

Prior to 2004, virtually no studies existed in this area. Fallon and Lucas (1991, 1993), which analyzed the effect of rigid employment laws in India and Zimbabwe, were the notable exception. They found a large impact on manufacturing jobs in India: formal employment for a given level of output declined by 17.5 percent after the introduction, in 1976, of rigid labor regulation. In Zimbabwe, their studies found a similar effect, albeit of smaller magnitude. However, Fallon and Lucas did not spur a literature on the effects of labor regulations.[1] They were cited primarily in research on real wage growth (for example, Velenchik, 1997) or the impact of structural adjustment.

In contrast, labor regulation has been the focus of much research in developed countries. Most papers quantify the efficiency costs of rigid regulation for outcomes like employment, unemployment and wages (Freeman, 1988; Lazear, 1990; Nickell, 1997; Blanchard and Wolfers, 2000; Blanchard and Portugal, 2001; Di Tella and MacCulloch, 2005), or on firms' investment strategies and productivity (Holmes, 1998; Autor, Kerr and Kugler, 2007, Kugler and Pica, 2008).

Another set of studies in developed countries analyze the effects of labor reforms. For example, Kugler, Jimeno and Hernanz (2005) study the 1997 reform by the Spanish government to reduce the incidence of temporary employment by reducing payroll taxes and dismissal costs for permanent contracts. They find that the reform increased the employment of young and older men on permanent contracts, and had large positive effects on the transitions from unemployment and temporary employment into permanent employment.

In this paper, we review the literature on employment laws in developing countries since 2004. Section 2 analyzes the findings of thirty studies. A selection criterion for the inclusion of papers is that they have been published in refereed journals or volumes. This choice is made to focus on robust analyses.

The studies generally find benefits in introducing flexible labor regulation. These benefits are unambiguous in studies on India. The findings using Latin American data are mixed, with a prevalence of results pointing to the benefits of flexible labor regulation. The cross-country studies show robust association between rigid labor regulation and high incidence of unemployment.

Section 3 presents cross-country correlation analysis to show that rigid labor regulations are associated with higher employment, larger informal sectors, and higher unemployment among the youth. These results are suggestive and serve to motivate

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[1] Prior to 2004, the two Fallon and Lucas papers were cited in less than a dozen published articles.

further research in this area. Section 4 outlines some areas for future analysis of the effect of labor regulations in developing countries. Section 5 concludes.

2. Review of Recent Literature

Why do governments intervene in the labor market? The rationale underlying such interventions is that free labor markets are imperfect, that as a consequence there are rents in the employment relationship, and that employers abuse workers to extract these rents, leading to both unfairness and inefficiency. For example, employers discriminate against disadvantaged groups, underpay workers who are immobile or invest in firm-specific capital, fire workers who then need to be supported by the state, force employees to work more than they wish under the threat of dismissal, fail to insure workers against the risk of death, illness or disability, and so on. In response to the perceived unfairness and inefficiency of the free market, every state intervenes in the employment relationship.

Countries have established a system of laws intended to protect the interests of workers and assure a minimum standard of living for the population at large. In addition to some basic civil rights protections, this system encompasses three bodies of law: employment law, collective relations law, and social security law. Employment laws, which are the focus of this paper, govern the individual employment contract. Collective or industrial relations laws regulate the bargaining, adoption, and enforcement of collective agreements, the organization of trade unions, and the industrial action by workers and employers. Social security laws govern the social response to needs and conditions that have a significant impact on the quality of life, such as old age, disability, death, sickness, and unemployment.

The question is whether all of these interventions improve the labor market, by making it fairer, or whether some result in job losses, lower investment and a move to the informal sector. This section reviews thirty recent studies on employment laws in developing countries. The studies generally follow an "origin" paper, be it Besley and Burgess (2004) on India, Heckman and Pagés (2004) on Latin America, and Botero et al (2004) on cross-country analysis.

Studies on India
Besley and Burgess (2004) is the first study that isolates the effect of labor reforms (across Indian states) from macroeconomic variables and changes in policies that are common across states. The motivation for this study is the stark variation in manufacturing growth across states. Between 1958 and 1992 manufacturing grew by 3.3 percent in India as a whole. However, in West Bengal output per capita was falling at an average rate of 1.5 percent per annum. (West Bengal was also a state that had the greatest body of pro-worker labor regulation passed in the state legislature.) Its performance contrasts with Andhra Pradesh which grew at nearly 6 percent per year over the same period. Andra Pradesh also experienced reforms that made labor regulation more flexible.

The Besley-Burgess data on labor regulation code state amendments to the Industrial Disputes Act of 1947. While the act was passed at the national level, state governments were given the right, under the Indian Constitution, to amend it. The authors read the text

of each amendment (121 in all) and classified each as pro-rigidity, pro-flexibility or neutral. This gave a sense of whether workers or employers benefited or whether the legislation had no appreciable impact on either group.

The main finding is that the pro-rigidity amendments to the Industrial Disputes Act are associated with lowered investment, employment, productivity and output in registered manufacturing. To illustrate this, consider Andhra Pradesh, which grew at 6 percent per annum between 1958 and 1992. The Besley-Burgess estimate predicts that it would have grown at 4.1 percent had it not passed flexible labor reforms. West Bengal, whose registered manufacturing output per capita declined at 1.5 percent per annum over the data period would have grown at 2.2 percent had it not legislated in a pro-worker direction. On average, labor reforms can explain more than two thirds of the difference in growth rates across states.

Regulating in a more-rigid direction is also associated with increases in urban poverty. West Bengal, for example, would have had 10 percent less poverty in 1990 had it not passed more rigid labor regulations. This amounts to 1.8 million less urban poor in West Bengal.[2]

The study has inspired a series of papers that look at particular aspects of labor regulation and their effect of economic and social outcomes. The first such study is Dutta Roy (2004), which examines the effects of a 1982 amendment to the Industrial Disputes Act. This amendment extended the prohibition to retrench workers without government authorization to firms that employed hundred or more workers (previously the cut-off was 300 workers). Dutta Roy finds evidence of small adjustment costs in employment. These adjustments took place with significant time lags.

A second paper, Aghion et al (forthcoming), studies the 1991 elimination of the system of industrial regulations on entry and production, on registered manufacturing output, employment, entry and investment across Indian states with different labor market regulations. Aghion et al use the data on state-level labor regulations from Besley and Burgess (2004) and interact them with data on industry licenses and import tariffs. The main finding is that industries located in states with flexible labor regulation grew more quickly than those in states with rigid labor regulation. For example, the largest positive effects of delicensing on state output are found in Andhra Pradesh and Tamil Nadu (and to a lower extent Karnataka, Kerala and Rajahstan), the states with the most flexible labor regulations. The largest negative effects are found in West Bengal and Maharashtra, the states with most rigid labor regulations. In Andhra Pradesh and Tamil Nadu output in the manufacturing sector was 15% higher in 1997 than if there had been no reform. In West Bengal, to the opposite, output was 20% lower in 1997 than if there had been no reform.

Another study, Hasan, Mitra and Ramaswamy (2007), looks specifically at the interaction of rigid labor regulation and trade policy and corroborates Aghion et al. It indicates that,

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[2] Foster and Rosenzweig (2003) use the Besley-Burgess data to show that villages in states with more rigid labor regulation have fewer factory jobs, as more people stay in farming. This has a net negative effect on rural income.

at the state level in India, employment rises faster due to liberalization where labor regulations are more flexible.

Bhattacharjea (2006) looks in detail at the Besley-Burgess coding and argues that there is some miscoding of individual amendments, as well as misleading aggregation procedures. Bhattacharjea shows that some econometric results do not appear to be robust. However, the overall result that rigid labor regulation results in net job losses remains.

Two recent papers extend the Besley-Burgess methodology to larger datasets of firms and more detailed treatment of laws. Ashan and Pagés (in this volume) find that laws that increase job security or increase the cost of labor disputes substantially reduce registered employment and output, with larger effects on output for amendments that increase the cost of labor disputes. Workers do not gain either, as such interventions do not increase the labor share or the wage bill. Labor-intensive industries, such as textiles, are most affected by higher labor dispute resolution costs.

Another paper, Amin (in this volume), studies the effect of rigid labor regulation on 2,000 retail stores in large Indian cities. In his dataset, 27% of the stores find labor regulations is a problem for their business. The author concludes that stricter labor regulation has a strong negative effect on employment. Labor reforms are likely to increase employment by 22 percent for the average store. This is a large effect when one takes into account the fact that the retail sector in India is the second largest employer, providing jobs to 9.4% of all workers. Rigid regulation is also shown to increase the size of the informal sector. In particular, labor reforms could reduce the level of informality by as much as 33% of the existing level.

Saha (2006) compares labor regulation in China and India. China's labor reforms were necessary for the creation of a free labor market, which then allowed fast industrial growth and rapid employment. In contrast, India's reluctance to reform its rigid labor laws has significantly lessened the favorable effects of industrial deregulation in the formal sector.

Sanyal and Menon (2005) study firms' locational choices and investment decisions in India. They consider rigid labor laws and their enforcement by labor courts and investigate whether these have detrimental effects on firm location and investment decisions. The study finds strong evidence that this is indeed the case: for a 1% increase in the number of labor courts within the state, the probability that a project will be located in this state decreases by approximately 0.3%.

This set of studies has had a significant impact on questioning the benefits of rigid labor regulation. A recent Ministry of Finance survey states: "Various studies indicate that Indian labor laws are highly protective of labor, and labor markets are relatively inflexible. Consequently, these laws have restricted labor mobility, have led to capital-intensive methods in the organized sector and adversely affected the sector's long-run demand for labor. Labor being a subject in the concurrent list, State-level labor

regulations are also an important determinant of industrial performance. Evidence suggests that States, which have enacted more pro-worker regulations, have lost out on industrial production in general" (Ministry of Finance, 2006, p.209).

Studies on Latin America

Heckman and Pagés (2004) is a collection of 11 studies on the effect of labor regulation on employment and growth in Latin America.[3] The main result is summarized in the introductory chapter: "The results presented in this volume suggest that mandated benefits reduce employment and job security regulations have a substantial impact on the distribution of employment and on turnover rates. The most adverse impact of regulation is on youth, marginal workers, and unskilled workers. Insiders and entrenched workers gain from regulation but outsiders suffer. As a consequence, job security regulations promote inequality among demographic groups."

The timing of Heckman and Pagés is propitious: in the 1980s and 1990s many Latin American countries restored democracy after long periods of military rule. These political changes brought about labor reforms. For example, in 1988 Brazil adopted a new Constitution that revised labor regulations that had been in place since the 1940s (Paes de Barros and Corseuil, 2004). It reduced the maximum working hours per week from 48 to 44 hours; reduced the maximum number of hours for a continuous work shift from 8 to 6 hours; increased the minimum overtime premium from 20 percent to 50 percent; and increased maternity leave from 3 to 4 months.

The new Constitution also modified the mandatory individual saving accounts system created in 1966. Prior to the reforms, the law required employers to deposit 8 percent of employees' wages in a worker-owned account. In case of separation, workers could withdraw the accumulated funds (plus the interest rate). In addition, if a firm initiated a separation it had to pay a penalty equivalent to 10 percent of the amount accumulated in the account. As part of the 1988 reform, this penalty was increased to 40 percent, considerably raising the cost of dismissing a worker. Similar reforms took place in Chile, the Dominican Republic and Nicaragua. In contrast, Colombia and Peru made labor regulation more flexible.

Mondino and Montoya (2004) and Saavedra and Torero (2004) study the effect of rigid labor regulation or the rate of employment in Argentina and Peru, respectively. Both find a significant adverse effect. Kugler (2004) analyzes the impact of reduced job security costs in Colombia after 1990. She finds a declining duration in unemployment, mostly explained by increased use of fixed-term contracts. In particular, she estimates that the reform brought about a 1.3 to 1.7 percentage points decline in unemployment. Montenegro and Pagés (2004) use a long series of repeated data spanning 40 years to study the effect of rigid labor regulation in Chile. They find that rigid regulation reduces the employment rates of youth and the unskilled, while increasing the employment rates of older and skilled workers. The most striking result is that women's employment

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[3] Two studies look at the determinants of labor demand, one study looks at employment duration in Argentina, while a fourth study analyzes the effect of unionization on employment in Uruguay. These are not discussed here.

declines with rigid regulation. Maloney and Nunez-Mendez (2004) study the effect of minimum wages on wages and employment across Latin America. They conclude that minimum wage regulation impacts the size of the informal sector as well as the wage levels in both the formal and informal sectors.

In contrast, Paes de Barros and Corseuil (2004) do not find significant effects of Brazil's 1988 reform, which increased the costs of dismissing redundant workers. Similarly, Downes et al (2004) find no significant effects of labor reform in three Caribbean states.

Outside of the research in Heckman and Pagés (2004), several other papers use data from Latin America to study the effect of labor regulation. Almeida and Carneiro (in this volume) do an in-depth analysis on Brazil. They find that that stricter enforcement of labor regulation constrains firm size, and also leads to reduced employment. In particular, a one percent increase in the number of labor inspections is associated with approximately a half-percent decline in employment and sales.

Eslava et al (2004) use a 1982-1998 plant level dataset for Colombia to show an increased productivity after reductions in labor regulation rigidities. In particular, temporary and part-time contracts were allowed with Law 50 in 1990. There is also increased redundancy of unproductive workers who were previously retained due to high dismissal costs.

Pagés and Montenegro (2007) develops and tests a model by which job security affects the age composition of employment. This model is based on the relative costs of dismissing young versus older workers resulting from job security provisions that are related to tenure. Using 39 consecutive annual household-surveys from Chile, they find that job security is associated with a substantial decline in the wage employment-to-population rate of young workers. In contrast, they do not find such a decline in young self-employment rates or in the wage employment rates of older workers. Comparing results for men and women and using measures of relative dismissal costs, Pagés and Montenegro find that the adverse effect of job security on youth employment is driven by the link between severance pay and tenure.

Finally, Kaplan (in this volume) studies the effects of labor-regulation reform using data for 10,396 firms in 14 Latin American countries. The data come from the World Bank Enterprise Surveys, where firms are asked both how many permanent workers they would have hired and how many they would have terminated if labor regulations were made more flexible. Kaplan finds that making labor regulations more flexible would lead to an average net increase of 2.08% in total employment. Firms with fewer than 20 employees benefit the most, with average gains in net employment of 4.27%. Countries with more regulated labor markets, such as Argentina, would experience larger gains in total employment. These larger gains in total employment, however, would be achieved through higher rates of hiring and higher rates of termination. The results may explain why there is substantial opposition to labor reforms despite the predicted gains in efficiency and total employment.

Cross-country Studies

Botero et al (2004) is the first cross-country study on labor regulation that covers developing countries. It investigates the regulation of labor markets through employment, collective relations, and social security laws in 85 countries. The main finding is that heavier regulation of labor is associated with lower labor force participation and higher unemployment, especially of the young. In particular, rigid collective relations laws are associated with a larger unofficial economy; rigid employment, collective relations, and social security laws lead to lower male (but not female) participation in the labor force; rigid employment laws lead to higher unemployment, especially of the young. Finally, there is weak evidence that more generous social security systems are associated with higher relative wages of privileged workers. The evidence on the unemployment of the young is consistent with the view that the privileged and older incumbents support more stringent labor laws, a finding echoed in the literature on developed countries.

Several studies followed, using the Botero et al dataset.[4] Caballero and others (2004) use a sectoral panel for 60 countries to find that job security regulation hampers the creative-destruction process, especially in countries where regulations are likely to be enforced. The authors conclude that moving from the 20th to the 80th percentile in job security, in countries with strong rule of law, cuts the annual speed of adjustment to shocks by a third while shaving off about one percent from annual productivity growth. However, rigid labor regulation has no effect in countries with weak rule of law.

Two other studies - Pierre and Scarpetta (2004) and Micco and Pagés (2006) - analyze the effect of rigid labor regulation on employment. Pierre and Scarpetta look at employers' perceptions on the rigidity of labor regulation in 80 developing countries. They find that employers' concerns about labor regulations are closely matched by the relative stringency of labor laws. But not all firms are affected in the same way by onerous labor regulations. Medium sized firms are those whose business and prospects for growth are most negatively affected. Similarly, innovating firms are disproportionately affected by rigid labor regulations. Micco and Pagés use sectoral data for 69 countries to find that employment protection reduces turnover, employment, and value added by reducing the growth of highly volatile sectors, such as leather products and apparel. The decline in employment is mostly accounted by a decline in net entry of firms, with insignificant changes in average employment and output per firm.

Feldmann (2008), using data on 74 countries for 2000-2003, finds that if Indonesia - a country with rigid regulations - had enjoyed the same flexibility in business regulation as Finland, Indonesia's unemployment rate would have been 2.1 percentage points lower among the total labor force and 5.8 percentage points lower among young people. The data on business regulation come from the Economic Freedom of the World index, developed by the Fraser Institute, whose labor regulation component is based on data

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[4] The dataset is available at http://www.economics.harvard.edu/faculty/shleifer/dataset. Parts of it are annually updated by the World Bank, available at http://www.doingbusiness.org/CustomQuery/. According to an October 10, 2008 search in the Scopus database, there are 69 published articles that cite the Botero et al (2004).

from Botero et al (2004). Feldmann (in this volume) uses an alternative dataset – by the World Economic Forum – to find similar results: rigid regulation reduces employment.

Several articles use the Botero et al dataset to study the interaction between labor regulation and trade policy. Freund and Bolaky (2008), Chang and others (forthcoming), Cunat and Melitz (2007) and Helpman and Itskhoki (2007) show that in the absence of flexible labor regulation, economies do not benefit from trade openness and can forego large employment opportunities.

Finally, two studies look at the effect of labor regulation on entrepreneurship. Ardagna and Lusardi (2008) study the effect of rigid labor regulation on entrepreneurship. They use a sample of 37 rich and developing countries to show that with flexible regulation the probability of starting a new entrepreneurial activity increases for people below the age of 44. More importantly, the interaction term between labor regulation and the fear of starting a new business is statistically significant for every measure of entrepreneurship. In countries with heavy labor regulations, workers are less willing to become entrepreneurs.

Van Stel, Storey, and Thurik (2007) use data for 39 countries to find strong negative effects on business entry rates of the labor market regulation measures 'rigidity of employment' and 'rigidity of hours,' both taken from Botero et al (2004). In countries where the flexibility of employers to hire and fire employees is higher, the various rates of entrepreneurship also tend to be higher. The authors offer two explanations. For employees, the safety of their paid job is less which may make them more likely to decide to start their own business (push effect). For entrepreneurs, they have more flexibility in running their business which makes business ownership more attractive (pull effect). Both effects imply higher entrepreneurship rates.

3. Correlations with Labor Market Outcomes
In this section we present partial correlations between labor regulation and labor market outcomes. The data do not allow a causal interpretation of the evidence: the analysis is purely suggestive. The reason for showing these correlations is to demonstrate the significant differences in the level of regulation across countries, and how regulation differs across types of countries.

To do so, we use three sources of data: the Doing Business database, the World Development Indicators, and informality data from the Global Competitiveness Report. The first two are produced by the World Bank, while the last one is produced by the World Economic Forum. The variable definitions are presented in Table 1. The sample size varies by database as explained below.

Labor market rigidity variables
Labor market rigidity is measured using the rigidity of employment index published by Doing Business. These data were originally developed by Botero et al (2004). Labor lawyers and experts were contacted in 178 countries to answer specific questions about the applicable labor legislation. The rigidity of labor regulations is assessed by scoring

those answers and establishing indices. The rigidity of employment index varies from 0 to 100, where higher numbers imply more labor market rigidity.

The sample covers 24 countries in OECD high income countries, 46 in Sub-Saharan Africa, 28 in Eastern Europe and Central Asia, 24 in East Asia and Pacific, 8 in South Asia, 17 in Middle East and North Africa, and 31 in Latin America and Caribbean.

There are 5 countries that score zero, having the most flexible labor regulation as measured by this index: Singapore, Hong Kong, United States, the Maldives and the Marshall Islands. No country scores 100. The highest score in practice is 79 attributed to Venezuela and Bolivia. The other countries with the highest labor market rigidity are Democratic Republic of Congo, scoring 74, Niger at 70, Panama, the Republic of Congo, and Angola, all at 69.

On average low income countries have higher labor market rigidity than high income countries (table 2). This difference is statistically significant at the 5% level, at 40.4 for the poorest countries vs. 31.1 for the richest.

Size of the informal sector variables
The size of the informal sector is measured as percentage of GDP. The data are based on the opinion of experts, who are asked to assess the size of the informal sector by choosing brackets with a size of 5 to10 percentage points.

The informal sector represents on average around 28% of the economy across the world. In poor countries this average jumps up to 36%. The sample covers 24 countries in OECD high income countries, 24 in Sub-Saharan Africa, 25 in Eastern Europe and Central Asia, 12 in East Asia and Pacific, 5 in South Asia, 8 in Middle East and North Africa, and 22 in Latin America and Caribbean. The country with the smallest informal sector is Singapore at 9%, followed by Switzerland, Iceland and Finland at 11% and Luxembourg and New Zealand at 12.5% (figure 1). Zambia is the country with the largest informal sector (45%), followed by Bolivia (43%), the Kyrgyz Republic (42%), Benin (42%), and Venezuela (41%).

Unemployment
Unemployment rates come from the World Development Indicators. They are defined as percentage of the labor force. The youth unemployment rate refers to the percentage of the labor force aged 15 to 24 that is actively searching employment. In these data, middle income countries tend to have higher unemployment rates than low income or high income countries. This seems to indicate that in low income countries high formal unemployment is replaced by a large informal sector.

Among the 87 countries with available information regarding unemployment rate, Macedonia FYR has the highest rate at 37%, followed by South Africa (28%). Macedonia FYR and South Africa are also the countries with the highest female and youth employment rates. The sample covers up to 24 countries in OECD high income countries, 3 in Sub-Saharan Africa, 19 in Eastern Europe and Central Asia, 9 in East Asia

and Pacific, 2 in South Asia, 10 in Middle East and North Africa and 20 in Latin America and the Caribbean.

Table 3 presents the results on the relationship between the size of the informal sector and labor market rigidity. Countries with more rigidity labor markets have a larger informal sector (figure 1). A 10 point increase in the rigidity of labor index is associated with an increase of 0.9 percentages points in the size of the informal sector.

This result is robust to the inclusion of other possible determinants of the size of the informal sector. Countries with higher business tax rates have larger informal sectors as showed in Djankov et al (2008a). Furthermore, it is plausible to expect that where it is more difficult to formally start a business, informal businesses would represent a larger share of the economy. Columns 2, 3, 5, and 6 in table 3 address these concerns. Although the number of procedures to start a business is associated with a larger informal sector, the labor market rigidity result still stands. Countries with more rigid labor markets have larger informal sectors, even after the difficulty of starting a formal business and paying business taxes are taken into account.

Labor market rigidity is also associated with higher unemployment rates as shown in table 4. We assess this relationship for 6 different measures of unemployment: overall rate, unemployment among female labor force (figure 2), unemployment among male labor force, and similar 3 measures focusing just on youth unemployment. For all 6 measures, higher labor market rigidity is associated with higher unemployment rates. However, the result is not significant at the 10% level for male youth unemployment rate.

A 10 point increase in the rigidity of labor index is associated with an increase of 0.7 percentage points in overall unemployment rate, 1.3 percentage points in youth employment rate and 1.7 percentage points in female youth unemployment rate. The analysis controls for log income per capita, as a proxy for the overall economic environment.

4. Directions for future research
The findings on the effect of labor regulation on employment and informality in developing countries are consistent with the new comparative economics literature started by Djankov (2003a). Studies in this literature show that economic outcomes are significantly affected by, for example, regulation of entry (Djankov et al 2002), enforcement of creditor rights (Djankov et al, 2003b; Safavian and Sharma, 2007), enforcement of labor laws (Almeida and Carneiro, in this volume), the presence of creditor rights and credit information (Djankov, McLiesh and Shleifer, 2007), and the protection of minority shareholders (for example, Djankov et al, 2008b).

Developing countries present an exciting venue for studying the impact of regulatory reforms, including of labor reforms. A number of countries, especially in Eastern Europe, have recently undergone significant reforms to make labor regulation more flexible. Examples include Albania, Azerbaijan, Georgia, and Macedonia FYR. In West Africa, Burkina Faso and Senegal passed significant amendments to their labor codes in 2007. In

contrast, several Latin American countries, most notably Bolivia and Venezuela, have made labor regulation more rigid. These reforms are larger in magnitude than any reforms in developed countries. Their effect on labor market outcomes can inform research on the relative importance of labor reforms as opposed to other types of reform.

Second, the link between labor regulation and productivity is best studied in the context of developing economies which display larger productivity gaps across firms in the same sector than can be found in developed countries. Cumbersome regulation makes it difficult for workers to move across firms and across industries (for example, Ciccone and Papaioannou, 2008). The absence of free interfirm and intersectoral movement impedes productivity increases, and likely contributes to higher job losses due to external economic shocks.

Third, reforms can be used to study job and wage dynamics: what happens to workers who are dismissed, who gets hired, and how do wages adjust when the labor market becomes more flexible. In Georgia, for example, aggregate employment statistics reveal that the share of single proprietorships (essentially, self-employed people) grew from 23,000 to half a million in the three years following the passing of the new labor law. In the same period, aggregate unemployment fell just 0.4%, as large gains in the private sector were accompanies by shrinking public employment.

Fourth, the link between labor regulation reforms and other reforms can be further investigated. A robust literature is emerging on the effect of labor regulation on trade liberalization, as in Freund and Bolaky (2008). This work can be extended to study entrepreneurship and innovation.

Finally, scholars can turn attention to the question why countries regulate their labor markets differently. A common hypothesis in the institutions literature is that culture determines the level of regulation, at least in countries where regulations have not been imposed forcefully through colonization (Stulz and Williamson, 2003). A recent study (Aghion et al, 2008) investigates this direction of causality: that culture influences regulation, but also the demand for regulation. Using the World Values Survey, they show both in a cross-section of 45 countries, and in a sample of individuals from around the world, that culture (measured by distrust) fuels support for government control over the economy. Even more interesting, distrust generates demand for regulation even when people realize that the government is corrupt and ineffective. Essentially, they prefer state control to unbridled production by "uncivil" firms.

5. Conclusions

This paper summarizes the research on the effect of employment laws in developing countries, using papers published since 2004. The survey is further supported by cross-country correlation analyses. The main finding is that developing countries with rigid labor regulation tend to have larger informal sectors and higher unemployment, especially among young workers.

Some studies also find that rigid labor regulation results in an increase in urban poverty, fewer business start-ups, foregone benefits from other (particularly trade and licensing) reforms, and in female unemployment. These results need further empirical support, using data for more countries and in the context of reform episodes.

The study of employment laws and the reform efforts of governments can also contribute to the broader "new comparative economics" literature on why governments regulate markets differently. As labor regulation is relatively new in most countries, some of the existing theories – for example, of the imposition of inappropriate regulation by colonizers – are easily discarded. This allows for a cleaner research design.

References

Aghion, Philippe, Robin Burgess, Stephen Redding, and Fabrizio Zilibotti, forthcoming, The Unequal Effects of Liberalization: Evidence from Dismantling the License Raj in India, *American Economic Review*.

Aghion, Philippe, Yann Algan, Pierre Cahuc, and Andrei Shleifer, 2008, "Regulation and Distrust," Department of Economics, Harvard University, working paper.

Ahsan, Ahmad, and Carmen Pagés, in this volume, Are All Labor Regulations Equal? Evidence from Indian Manufacturing," *Journal of Comparative Economics*.

Ardagna, Silvia and Annamaria Lusardi, 2008, "Explaining International Differences in Entrepreneurship: The Role of Individual Characteristics and Regulatory Constraints," mimeo, Harvard University, Cambridge, Massachusetts.

Autor, David, Adriana Kugler and William Kerr, 2007, "Do Employment Protections Reduce Productivity? Evidence from U.S. States, *Economic Journal*, 117, 2: F189-F217.

Besley, Timothy and Robin Burgess, 2004, "Can Labor Regulation Hinder Economic Performance? Evidence from India," *Quarterly Journal of Economics*, 119, 1: 91–134.

Bhattacharjea, Aditya, 2006, "Labour Market Regulation and Industrial Performance in India: A Critical Review of the Empirical Evidence," *Indian Journal of Labour Economics*, 49, 2: 211-232.

Blanchard, Olivier and Justin Wolfers, 2000, "The role of shocks and institutions in the rise of European unemployment: Aggregate Evidence," *Economic Journal*, 110, 1: 1-33.

Blanchard, Olivier and Pedro Portugal, 2001, "What Hides Behind an Unemployment Rate: Comparing Portuguese and U.S. Labor Markets," *American Economic Review*, 91, 2: 187-207.

Botero, Juan, Simeon Djankov, Rafael La Porta, Florencio Lopez-de-Silanes, and Andrei Shleifer, 2004, "The Regulation of Labor", *Quarterly Journal of Economics*, 119, 3: 1339-1382.

Chang, Roberto, Linda Kaltani and Norman Loayza, forthcoming, "Openness Can Be Good for Growth: The Role of Policy Complementarities," *Journal of Development Economics*.

Di Tella, Rafael, and Robert MacCulloch, 2005, "The Consequences of Labor Market Flexibility: Panel Evidence Based on Survey Data," *European Economic Review*, 49, 5: 1225-59.

Djankov, Simeon, Rafael La Porta, Florencio Lopez-de-Silanes and Andrei Shleifer, 2002, "The Regulation of Entry," *Quarterly Journal of Economics*, 117: 1-37.

Djankov, Simeon, Edward Glaeser, Rafael La Porta, Florencio Lopez-de-Silanes and Andrei Shleifer, 2003a, "The New Comparative Economics," *Journal of Comparative Economics*, 31, 4: 595-619.

Djankov, Simeon, Rafael La Porta, Florencio Lopez-de-Silanes and Andrei Shleifer, 2003b, "Courts," *Quarterly Journal of Economics*, 118, 2: 453-517.

Djankov, Simeon, Caralee McLiesh, and Andrei Shleifer, 2007, "Private Credit in 129 Countries," *Journal of Financial Economics*, 84, 2: 299-329.

Djankov, Simeon, Tim Ganser, Caralee McLiesh, Rita Ramalho, and Andrei Shleifer, 2008a, The Effect of Corporate Taxes on Investment and Entrepreneurship, Working paper 13756, National Bureau for Economic Research, Cambridge, Massachusetts.

Djankov, Simeon, Rafael La Porta, Florencio Lopez-de-Silanes, and Andrei Shleifer, 2008b, "The Law and Economics of Self-Dealing," *Journal of Financial Economics*, 88, 3: 430-465.

Downes, Andrew, Nlandu Mamingi and Rose-Marie Antoine, 2004, "Labor Market Regulation and Employment in the Caribbean," in James Heckman and Carmen Page, eds. *Law and Employment: Lessons from Latin America and the Caribbean*, (Chicago: The University of Chicago Press).

Dutta Roy, Sudipta, 2004, "Employment dynamics in Indian industry: adjustment lags and the impact of job security regulations," *Journal of Development Economics*, 73, 1: 233-256.

Eslava, Marcela, John Haltiwanger, Adriana Kugler and Maurice Kugler, 2004, "The effects of structural reforms on productivity and profitability enhancing reallocation: evidence from Colombia," *Journal of Development Economics*, 75, 3: 333-371.

Fallon, Paul, and Robert Lucas, 1991, "The Impact of Changes in Job Security Regulations in India and Zimbabwe," *World Bank Economic Review*, 5, 3: 395-413.

Fallon Paul, and Robert Lucas, 1993, "Job Security Regulations and the Dynamic Demand for industrial labor in India and Zimbabwe," *Journal of Development Economics*, 40, 214-275.

Feldmann, Horst, 2008, "Business Regulation and Labor Market Performance around the World," *Journal of Regulatory Economics*, 33, 2: 201-235.

Feldmann, Horst, in this volume, "The Unemployment Effects of Labor Regulation around the World," *Journal of Comparative Economics*.

Foster, Andrew, and Mark Rosenzweig, 2003, "Agricultural Development, Industrialization and Rural Inequality," Department of Economics, Yale University, mimeo.

Freeman, Richard, 1998, "Labor Market Institutions and Economic Performance," *Economic Policy*, 6, 64-80.

Freund, Caroline, and Bineswaree Bolaky, 2008, "Trade, Regulations, and Income," *Journal of Development Economics*, 87, 2:309-321.

Hasan, Rana, Devashish Mitra and K.V Ramaswamy, 2007, "Trade Reforms, Labor Regulations, and Labor-Demand Elasticities: Empirical Evidence from India," *Review of Economics and Statistics*, 89, 3: 466-481.

Heckman, James and Carmen Pagés, 2004, *Law and Employment: Lessons from Latin America and the Caribbean*, (Chicago: The University of Chicago Press).

Holmes, Thomas, 1998, "The Effect of State Policies on the Location of Manufacturing: Evidence from State Borders," *Journal of Political Economy*, 106, 667-705.

Kaplan, David, in this volume, "Labor Regulation and Job Creation in Latin America," *Journal of Comparative Economics*.

Kugler, Adriana, 2004, "The Effect of Job Security Regulations on Labor Market Flexibility: Evidence from the Colombian Labor Market Reform," in James Heckman and Carmen Page, eds. *Law and Employment: Lessons from Latin America and the Caribbean*, (Chicago: The University of Chicago Press).

Kugler, Adriana and Kugler, Maurice, "The Labor Market Effects of Payroll Taxes in a middle Income country: Evidence from Colombia". CEPR Discussion Paper No. 4046, 2003.

Kugler, Adriana, Juan Jimeno and Virginia Hernanz, 2005, "Employment Consequences of Restrictive Permanent Contracts: Evidence from Spanish Labor Market Reforms," mimeo, University of Houston.

Kugler, Adriana, and Giovanni Pica, 2008, "Effects of Employment Protection on Job and Worker Flows: Evidence from the 1990 Italian Reform," *Labour Economics*, 15, 1: 78-95.

Lazear, Edward, 1990, "Job Security Provisions and Employment," *Quarterly Journal of Economics*, 105, 699-726.

Maloney, William and Jairo Nuñez Mendez, 2004, "Measuring the Impact of Minimum Wages: Evidence from Latin America," in James Heckman and Carmen Page, eds. *Law*

and Employment: Lessons from Latin America and the Caribbean, (Chicago: The University of Chicago Press).

Micco, Alejandro, and Carmen Pagés, 2006, "The Economic Effects of Employment Protection: Evidence from International Industry-Level Data," IZA Discussion Papers 2433, Institute for the Study of Labor, Bonn, Germany.

Ministry of Finance, Government of India (2006), Economic Survey 2005-2006.

Mondino, Guillermo and Silvia Montoya, 2004, "The Effect of Labor Market Regulations on Employment Decisions by Firms: Empirical Evidence for Argentina," in James Heckman and Carmen Page, eds. *Law and Employment: Lessons from Latin America and the Caribbean*, (Chicago: The University of Chicago Press).

Montenegro, Claudio and Carmen Pagés, 2004, "Who Benefits from Labor Regulation? Chile 1960-1998," in James Heckman and Carmen Page, eds. *Law and Employment: Lessons from Latin America and the Caribbean*, (Chicago: The University of Chicago Press).

Nickell, Stephen, 1997, "Unemployment and Labor Market Rigidities: Europe versus North America," *Journal of Economic Perspectives*, 11, 55-74.

Paes de Barros, Ricardo and Carlos H. Corseuil, 2004, "The Impact of Regulations on Brazilian Labor Market Performance," in James Heckman and Carmen Page, eds. *Law and Employment: Lessons from Latin America and the Caribbean*, (Chicago: The University of Chicago Press).

Pagés, Carmen, and Claudio Montenegro, 2007, "Job Security and the Age-Composition of Employment: Evidence from Chile," *Estudios de Economia*, 34, 2: 165-187.

Safavian, Mehnaz and Siddharth Sharma, 2007, "When Do Creditor Rights Work?," *Journal of Comparative Economics*, 35, 3: 484-508.

Saavedra, Jaime and Máximo Torero, 2004, "Labor Market Reforms and their Impact over Formal Labor Demand and Job Market Turnover: The case of Peru," in James Heckman and Carmen Page, eds. *Law and Employment: Lessons from Latin America and the Caribbean*, (Chicago: The University of Chicago Press).

Saha, Bibhas, 2006, "Labor Institutions in China and India: A Tale of Two Nations," *Journal of South Asian Development*, 1, 2: 179-205.

Sanyal, Paroma and Nidhiya Menon, 2005, "Labor Disputes and the Economics of Firm Geography: A Study of Domestic Investment in India", *Economic Development and Cultural Change*, 53: 825-54.

Stulz, Rene and R. Williamson, 2003, "Culture, Openness, and Finance," *Journal of Financial Economics*, 70, 3:313-349.

van Stel, Andre, David Storey, and Roy Thurik, 2007, "The Effect of Business Regulations on Nascent and Young Business Entrepreneurship," *Small Business Economics*, 28, 2-3: 171-186.

Velenchik, Ann, 1997, "Market Power, Firm Performance and Real Wage Growth in Zimbabwean Manufacturing," *World Development*, 25, 5: 749-762.

Figure 1 Employment Laws and informality
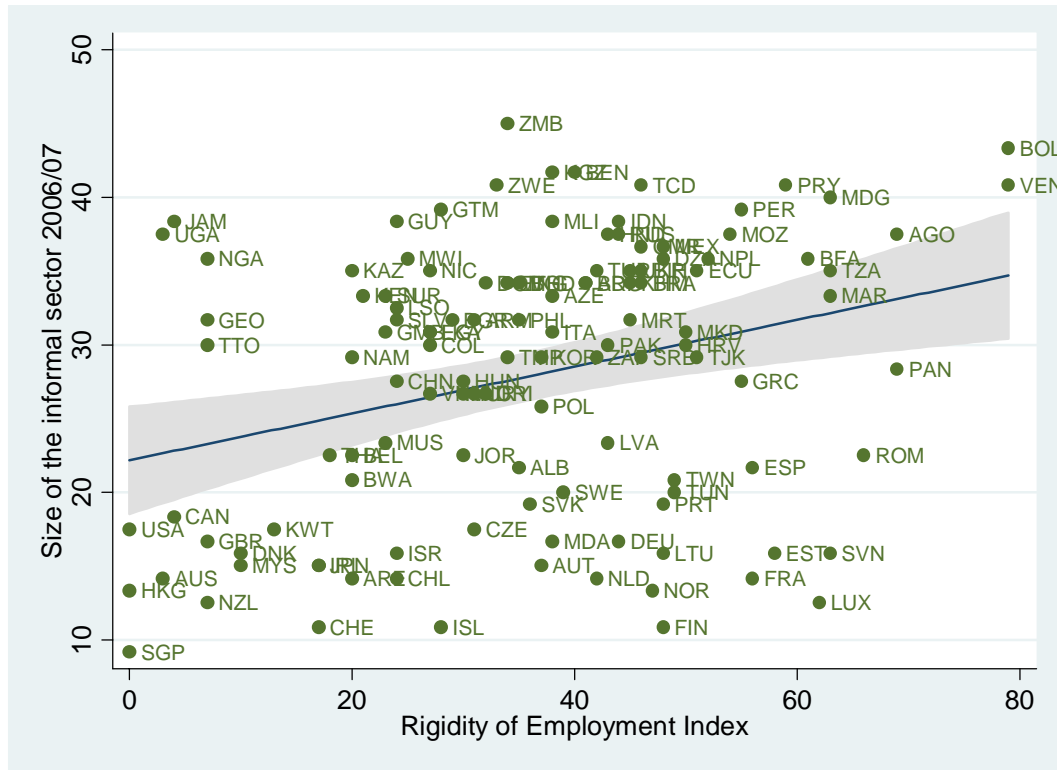
Note: This is a partial correlation, where the analysis controls for log income per capita. The rigidity of employment index is the average of 3 sub-indices: a difficulty of hiring index, a rigidity of hours index and a difficulty of firing index. All sub-indices take values between 0 and 100, with higher values indicating more rigid regulation. They are adapted from Botero et al (2004). The Size of the informal sector variable is constructed from the answer to the question "How much business activity is your country would you estimate to be unofficial or unregistered," scaled from 0 to 100 percent. The question is part of the business survey used by the World Economic Forum.

Figure 2 Employment laws and female unemployment
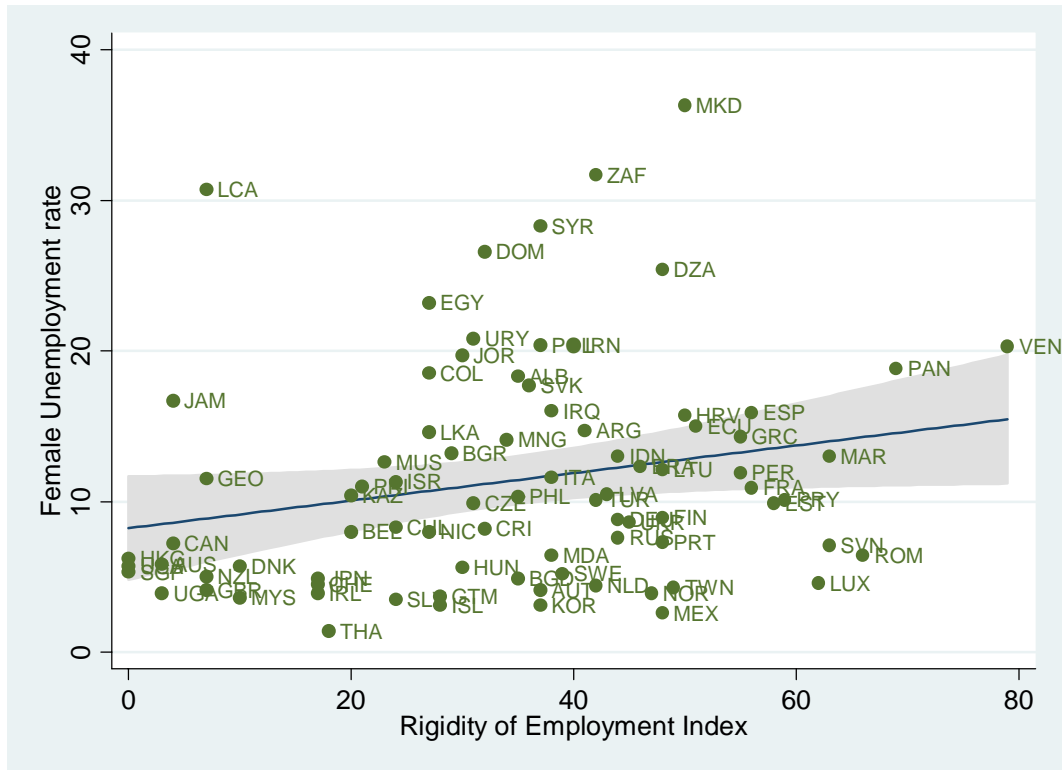
Note: This is a partial correlation, where the analysis controls for log income per capita. The rigidity of employment index is the average of 3 sub-indices: a difficulty of hiring index, a rigidity of hours index and a difficulty of firing index. All sub-indices take values between 0 and 100, with higher values indicating more rigid regulation. They are adapted from Botero et al (2004). The female unemployment rate variable is constructed as the share of the female labor force that is without work but available for and seeking employment. The data are collected by the International Labour Organization, in its Key Indicators of the Labour Market database.

Table 1 Variable definitions

Variable name	Source	Definition
Rigidity of Employment Index	World Bank (Doing Business Dataset) update of Botero et al (2004)	The rigidity of employment index is the average of 3 subindices: a difficulty of hiring index, a rigidity of hours index and a difficulty of firing index. All subindices take values between 0 and 100, with higher values indicating more rigid regulation.
Size of informal sector 2006/07	World Economic Forum (Global Competitiveness Report)	Answer to the question "How much business activity is your country would you estimate to be unofficial or unregistered," scaled from 0 to 100 percent.
Size of informal sector average 2004-07	World Economic Forum (Global Competitiveness Report)	Average over 3 years of the variable described above.
Unemployment rate	World Bank (World Development Indicators)	The share of the labor force that is without work but available for and seeking employment. International Labour Organization, Key Indicators of the Labour Market database.
Female Unemployment rate	World Bank (World Development Indicators)	The share of the female labor force that is without work but available for and seeking employment. International Labour Organization, Key Indicators of the Labour Market database.
Male Unemployment rate	World Bank (World Development Indicators)	The share of the male labor force that is without work but available for and seeking employment. International Labour Organization, Key Indicators of the Labour Market database.
Youth Unemployment rate	World Bank (World Development Indicators)	The share of the labor force ages 15-24 without work but available for and seeking employment. International Labour Organization, Key Indicators of the Labour Market database.
Female Youth Unemployment rate	World Bank (World Development Indicators)	The share of the male labor force ages 15-24 without work but available for and seeking employment. International Labour Organization, Key Indicators of the Labour Market database.
Male Youth Unemployment rate	World Bank (World Development Indicators)	The share of the female labor force ages 15-24 without work but available for and seeking employment. International Labour Organization, Key Indicators of the Labour Market database.
Log of GNI pc (2006)	World Bank (World Development Indicators)	GNI per capita is the gross national income, converted to U.S. dollars using the World Bank Atlas method, divided by the midyear population. GNI is the sum of value added by all resident producers plus any product taxes (less subsidies) not included in the valuation of output plus net receipts of primary income (compensation of employees and property income) from abroad. GNI, calculated in national currency, is usually converted to U.S. dollars at official exchange rates for comparisons across economies, although an alternative rate is used when the official exchange rate is judged to diverge by a large margin from the rate actually applied in international transactions. World Bank national accounts data, and OECD National Accounts data files.
Total Tax Rate	World Bank (Doing Business Dataset), updated from Djankov et al (2008)	The amount of taxes and mandatory contributions payable by a standardized business in the second year of operation, expressed as a share of commercial profits.
Procedures to start a business	World Bank (Doing Business Dataset), updated from Djankov et al (2002)	All procedures that are officially required for an entrepreneur to start up and formally operate an industrial or commercial business. These include obtaining all necessary licenses and permits and completing any required notifications, verifications or inscriptions for the company and employees with relevant authorities.

Table 2 Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Rigidity of Employment Index	178	34.1	18.5	0.0	79.0
Size of informal sector 2006/07	120	27.8	9.3	9.2	45.0
Size of informal sector average 2004-07	121	28.2	8.7	10.0	45.0
Unemployment rate	87	9.9	6.2	1.3	36.7
Female Unemployment rate	83	11.4	7.4	1.4	36.3
Male Unemployment rate	83	9.3	6.0	1.6	37.0
Youth Unemployment rate	68	19.4	11.8	4.8	65.7
Female Youth Unemployment rate	68	21.1	13.6	5.1	66.5
Male Youth Unemployment rate	68	18.3	10.9	4.5	65.2

By income group

Variable	1st quartile	2nd quartile	3rd quartile	4th quartile	T-test 4th vs. 1st quartile		Total
Rigidity of Employment Index	40.4	33.2	33.8	31.1	2.249	**	34.1
Size of informal sector 2006/07	35.6	33.0	29.2	18.4	11.658	***	27.8
Size of informal sector average 2004-07	35.5	32.9	29.9	19.0	11.809	***	28.2
Unemployment rate	3.8	9.6	13.3	7.4	-1.345		9.9
Female Unemployment rate	4.4	13.0	15.4	7.8	-1.075		11.4
Male Unemployment rate	3.4	9.2	11.9	7.1	-1.464		9.3
Youth Unemployment rate	5.7	18.9	26.7	16.0	-1.674	*	19.4
Female Youth Unemployment rate	5.5	22.2	29.9	16.6	-1.549		21.1
Male Youth Unemployment rate	5.8	17.3	24.3	15.7	-1.739	*	18.3

Table 3 Employment Laws and the Size of the Informal Sector

	(1)	(2)	(3)	(4)	(5)	(6)
	Size of informal sector 2006/07			Size of informal sector average 2004-07		
Rigidity of Employment Index	0.085	0.087	0.07	0.096	0.099	0.088
	(0.031)***	(0.031)***	(0.031)**	(0.031)***	(0.031)***	(0.032)***
Log of GNI pc (2006)	-4.088	-4.176	-3.816	-4.251	-4.362	-4.136
	(0.338)***	(0.348)***	(0.369)***	(0.337)***	(0.344)***	(0.372)***
Total Tax Rate		-0.017	-0.019		-0.023	-0.024
		(0.016)	(0.016)		(0.016)	(0.016)
Procedures to start a business			0.442			0.276
			(0.177)**			(0.180)
Constant	58.561	60.062	53.897	57.364	59.271	55.41
	(3.215)***	(3.499)***	(4.217)***	(3.195)***	(3.457)***	(4.255)***
Observations	116	116	116	117	117	117
R-squared	0.6	0.6	0.62	0.62	0.63	0.64

Standard errors in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 4 Employment Laws and Unemployment

	(1)	(2)	(3)	(4)	(5)	(6)
	Unemployment rate	Female Unemployment rate	Male Unemployment rate	Youth Unemployment rate	Female Youth Unemployment rate	Male Youth Unemployment rate
Rigidity of Employment Index	0.07	0.08	0.061	0.134	0.168	0.109
	(0.035)**	(0.043)*	(0.033)*	(0.076)*	(0.086)*	(0.071)
Log of GNI pc (2006)	-1.19	-2.039	-1.062	-1.893	-2.687	-1.406
	(0.470)**	(0.588)***	(0.452)**	(1.090)*	(1.238)**	(1.025)
Constant	17.868	26.766	16.407	31.902	39.743	27.223
	(4.487)***	(5.618)***	(4.325)***	(10.747)***	(12.203)***	(10.102)***
Observations	83	80	80	66	66	66
R-squared	0.13	0.18	0.11	0.1	0.14	0.07

Standard errors in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

All the unemployment rates refer to 2003